

AMENDMENTS TO THE CLAIMS

Please amend the claims as follows. Claims 22, 23, 28, 29, and 35-37 are canceled without prejudice or disclaimer to the subject matter contained therein.

1-19 (Canceled)

20 (Currently Amended) A plasma etching method of performing plasma etching to an object made of silicon in a treatment chamber, said plasma etching method comprising:
introducing, into the treatment chamber, an etching gas which includes a fluorine compound gas and a rare gas;
energizing the etching gas into a plasma state by supplying electricity to the etching gas, the electricity having a frequency that is equal to or more than 27 MHz; and
etching the object using the plasma,
wherein the fluorine compound gas is one of sulfur hexafluoride (SF₆) gas and nitrogen trifluoride (NF₃) gas,
wherein the rare gas is helium (He) gas, and
wherein a volumetric flow rate of the helium (He) gas introduced into the treatment chamber is equal to or more than 80% of a total volumetric flow rate of the etching gas.

21 (Original) The plasma etching method according to Claim 20,
wherein the etching gas further includes one of oxygen (O₂) gas, carbon monoxide (CO) gas, and carbon dioxide (CO₂) gas, and
the fluorine compound gas is sulfur hexafluoride (SF₆) gas.

22 (Canceled)

23 (Canceled)

24 (Currently Amended) The plasma etching method according to Claim 21, 23,
wherein an inside wall of the treatment chamber is made of an insulating material.

- 25 (Original)** The plasma etching method according to Claim 24,
 wherein the insulating material is one of quartz, alumina, an aluminum matrix with
 alumite treatment, yttrium oxide, silicon carbide, and aluminum nitride.
- 26 (Original)** The plasma etching method according to Claim 21,
 wherein the etching gas further includes chlorine (Cl₂) gas.
- 27 (Currently Amended)** The plasma etching method according to Claim 26,
 wherein a volumetric flow rate~~volume~~ of the chlorine (Cl₂) gas introduced into the
 treatment chamber is equal to or less than 10% of a total volumetric flow rate of the etching gas.
- 28 (Canceled)**
- 29 (Canceled)**
- 30 (Original)** The plasma etching method according to Claim 20,
 wherein the etching gas further includes polymer forming gas, and
 the fluorine compound is sulfur hexafluoride (SF₆) gas.
- 31 (Original)** The plasma etching method according to Claim 30,
 wherein the polymer forming gas is one of octafluorocyclobutane (C₄F₈) gas,
 trifluoromethane (CHF₃) gas, octafluorocyclopentene (C₅F₈) gas, and hexafluorobutadiene (C₄F₆)
 gas.
- 32 (Currently Amended)** The plasma etching method according to Claim 20,
 wherein the etching gas further includes one of oxygen (O₂) gas, carbon monoxide (CO)
 gas, and carbon dioxide (CO₂) gas,
 the fluorine compound gas is sulfur hexafluoride (SF₆) gas,
 the etching gas comprises a first etching gas, and
 etching the object using the plasma constitutes~~comprises~~ a first etching,

the method further comprising:

a second etching of the object after the first etching using a second etching gas which includes a polymer forming gas and sulfur hexafluoride (SF₆) gas as a fluorine compound gas.

33 (Previously Presented) The plasma etching method according to Claim 20,
wherein the etching gas is energized into a plasma state by an inductively coupled plasma (ICP) method.

34 (Original) A device which etches a silicon substrate,
said device forming a trench in the silicon substrate using the plasma etching method according to Claim 20.

35-37 (Canceled)